Development of Mudcracks in a Partially-Dried Tropical Pond

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Mudcracks formed in a partially-dried, tropical rain-water pond display distinctive crack patterns. The development of these cracks are governed and influenced by their position within the pond (which determines the thickness of the top mud layer), the rate and extent of drying that they undergo, and the length of exposure to drying period. Two generations of cracks were recognised — a first generation of mudcracks which developed within the top mud layer and a second set which forms within the underlying silty-mud layer. The first generation mudcracks begin its development at the pond margin areas where the mud layer is thin and the rate of drying is rapid. These cracks are then progressively propagated towards the pond centre where the rate of pore water expulsion (evaporation) from the thick, water-laden layer of mud is much slower. Rapid drying within the pond margin areas accelerate the development of several orders of shallow and wide cracks, and result in the formation of well-dried,

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small and thin concaving mud polygons. In the region at the centre of the pond, the thickness of the mud layer retards the drying process, thus resulting in the formation of widely-separated, deep and narrow cracks which join up to form large polygons. The development of the second generation of cracks are restricted to the pond margin areas. Prolonged drying result in the contraction of the underlying silty-mud layer exposed by the earlier, wide-opening first generation cracks. These second-level cracks may develop as central fissures on first-generation crack terraces.